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Original: The Director of Central Intelligence

cc: Military Representative of the President

Special Assistant to the President for National Security Affairs

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The Director, Defense Intelligence Agency

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Following is a verbatim translation of an article entitled "The First Experiment in the Use of Video Communications", by Lieutenant-Colonel Ye. Lazarev. This article appeared in Issue No. 34, 1961, of the Soviet military publication Collection of Articles of the Journal Military News (Voyennyy Vestnik). This publication

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The First Experiment in the Use of Video Communications

bу

Lt.-Colonel Ye. Lazarev

The implementation of video communications does not eliminate the need for special channels, allowing the passage of oscillations of a very broad frequency spectrum. The transmission of a limited number of frames per second and poor lighting do not interfere with it. It is possible to reduce considerably the number of frames being transmitted per second in the video communications apparatus without impairing the visual quality of the information. Consequently it is possible to receive oscillations with a frequency spectrum which can be successfully transmitted over existing channels of radio-relay communications, and to make these communications secure. Narrowing of the frequency spectrum simplifies the documentation of the images, in particular, recording them on magnetic tape. The process of exchanging documents takes place in several seconds.

At the command-staff exercise with the professor-instructor staff of the Academy i/n M. V. Frunze (February 1960), an industrial type of television apparatus (PTU-OM) was employed for video communications. It was set up at the command posts of the army, of several divisions, and at the command post of the front (in the directing HQ). The apparatus was adapted for transmission and reception of graphic documents.

In our first attempt we succeeded in investigating the following questions: the permissible dimensions of the portion of the map being transmitted at the division - army level; the necessary clarity of the image; the advantages provided by video communication between control posts; the possibility of using small frame (narrow band) television for video communication purposes. Data reports about the

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television sca	een variou	us objects,	documer	its, and maps.	

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situation were transmitted over video communications at night, when officers were tired and the situation was tense.

The results of the video transmissions are given in Table 1.

The apparatus gave an image clarity of about 200 lines. Data in the table show that there were almost no problems caused by unintelligibility of the image. Only in two instances did they arise in connection with the fact that the orientation of the position of units of a division was carried out on terrain built up with detached houses. Their topographical symbols on the map (scale 1:100,000) measured 0.4 x 0.8 mm. Let us note that some small details can be successfully restored on a map, by the person receiving, from the words of the person transmitting.

We consider that not all symbols shown on a map need be transmitted, but only the conventional symbols marking the positions of troops, lines which they have reached, or boundaries of the path of the radioactive cloud. Others are: inhabited localities, the road network, rivers, bench marks and soil-vegetation cover. An atomic burst, causing enormous devastation in a large area, abruptly changes the appearance of the terrain. Under these conditions it is possible to orient oneself only by the ground relief, which should be shown on maps in greater detail.

We checked the possibility of transmitting conventional symbols for maps with a scale of 1:50,000 and 1:100,000. The clarity which the apparatus gave was 300 lines. Unidentified symbols and their dimensions are given in Table 2.

Some 364 symbols and type sizes were checked. On a map with a scale of 1:50,000 only 3 of these symbols were unidentifiable, on a map with a scale of 1:100,000 there were 26. But as is evident from the meanings of the unidentifiable symbols, they do not have special significance for transmitting information. Triangulation points and bench marks are the only exceptions. However, when necessary, they can be entered on the map beforehand. It is also possible to make the practical deduction that great clarity in the video communications process is not obligatory. If the situation is entered on maps with a scale of 1:50,000 and 1:100,000, then for the dimensions of a section 200 x 200 mm being transmitted, a clarity of 300 lines is adequate. Narrow-band television is quite suitable for the purpose of video communications between control posts.

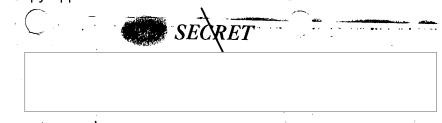


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	The video communication apparatus permits the commander to get, in a short period of time, an idea of the general nature of the operations of the troops under his command in the positions occupied by them. Not one of the existing means of communication possesses such potentialities. Here one glance at the screen is enough to obtain a comprehensive presentation of the situation that has arisen in the troops.	
	The video communication apparatus appreciably reduces the time for transmitting situation data. This is ensured by the large volume of information, even including reports on the previous status of the troops, since, as a rule, they are entered on the map. The reduction of time for transmitting information will obviously bring about a reduction in the number of telephone channels, which is very important.	
	The conclusion may be drawn that the video communications apparatus will also find application in an automated control system.	
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Courents	The operator succeeded in entering the situation on the say during the reception thre	Same as above and also defined the mission of the division.		Data mere transmitted onlabout the left flank of the division		The situation of entirele energy units was transmitted			Images of the ground zero of three enemy atomic bursts were transmitted	Images of the pround zero of four enemy atomic bursts were transmitted		50X1-HUM
Cuestions not connected with the cuality of the image	•	~	-3	<b>.</b>	•	•	<b>n</b>	•	•	•	•	
No. of times map was moved lefting the course of the report	8	•	<b>m</b>	•	~	•	п		-3	<b>v</b>	5 of 6	
Ulmensions of portion of map being transmitted in mm	150 × 300	260 x 200	300 x 200	150 x 150	Two sectors here transmitted, serenated by a distance of 2000	1-0 × 150	150 x 250	20:) x 200	400 x 260	350 × 400	280 x 200	
o. o' cuestions caused by unintel- ligibility o' the image.	77	•	٦	• •		•	•	•	•	•		
pents win reject pug of	23.08	23.13	% <b>0</b> 00	92.04	c2.1h	02.29	C7.17	%•°00	10.15	13.02	13:18	
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Nature of the transmission	Situation	Situation rejert	Situation	Situation	Hoar units situation rejort	Situation	fituation report	Situation report	Situation	Cituation rejort and clarification of masion	Defining divisional concentration area	50%

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## Table 2

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Meaning of conventional symbol	Dimensions of on map s	Comments	
	1:50,000	1:100,000	. ,
Rayon centers and post- relay stations (Somony and urto)	1.6 x 1.6	1.6 x 1.6	Complex shape
Groups of nomad tents (Stoyanki yurt, chumov)	0.8 x 1.6	0.8 x 1.6	Same as above
Mines, mine galleries	•	1.2	.+ symbol
Oil and natural gas derricks Fuel storage and natural gas tank	•	0.6 x 2.0 1.2	recognized
Fuel pumps (avtokolonki) Radio towers Water-driven sawmills	•	1.0 - 1.8	
Triangulation points Points on burial mounds (kurgan)	•	1.5 - 0.8 1.2 1.2	
Range survey points (punkty poligonometrii)	<b>*</b>	0.9	
Boundary markers Dikes (artificial instal- lations regulating the flow of rivers)	•	0.8 - 1.2	A dark blue . line on light blue back-
Embankments, stone, wooden	*. <b>•</b>	2.0 - 4.0	ground
Stones Rock shore	•	1.5 - 0.9 1.5 - 0.6	
Magnetic anomalies Sound and fog stations Impassable saltmarshes	1.2 1.8	0.9 - 1.3	Vertical hachures not
Lichen vegetation			visible; they run together.
Type size of an in- habited locality for secondary names and lettering beyond the margin	•	1.2; 0.3	
Type size of the number of houses	•	1.2	
Notations of elevations and depths	•	1.2	
Load capacity of ferries, height of waterfalls, bush	•	1.2	

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